California Regional Water Quality Control Board
Lahontan Region

FACT SHEET
PETROLEUM HYDROCARBON CLEANUP APPROACH OR SOILS

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Governor

This Fact Sheet describes guidelines for when "No Further Action" is required at sites where petroleum hydrocarbons remain in soil. This guidance is narrative in format, specifying no numerical criteria, because of the wide range of site conditions and circumstances within the Lahontan Region. For further information refer to the October 1997 Staff Report or contact Board staff at the address noted below.

1. Soil cleanup criteria

The Lahontan Water Quality Control Plan (Basin Plan) page 4.2-5 states that "*The Regional Board will determine soil cleanup levels for the unsaturated zone based on threat to water quality....If it is unreasonable to clean up soils to background concentration levels, the Regional Board may consider site-specific recommendations for soil cleanup levels above background provided that applicable ground water quality objectives are met and health risks from surface or subsurface exposure meet current guidelines*." A site-specific evaluation is necessary to demonstrate that cleanup to background was considered and is not reasonable (based on technical or economical factors). Soil cleanup levels may then be site-specific based on threat to water quality.

2. Site assessment is complete

A complete site assessment must determine with reasonable certainty the full vertical and lateral extent of petroleum hydrocarbons in soil and that no threat of pollution to ground water remains. For gasoline station sites, MTBE concentrations in soil and ground water must be evaluated. All technical reports must be signed by a California registered civil engineer, geologist, or certified engineering geologist. For small spills consider excavation of contaminated soil rather than conducting a site assessment. The site assessment must provide data evaluating cleanup of soils to background. It may be necessary to collect water samples in areas with shallow ground water to determine whether contaminants reached ground water.

3. No free draining product remains

Depending on the size and source of the spill or release, liquid and gaseous phase petroleum hydrocarbons may remain mobile for long periods of time and threaten ground water. Soil holding capacity varies and is a function of soil properties, depth to ground water and other site conditions. A paint filter test, or similar method, may be used to demonstrate soil holding capacity.

4. No leaching affecting beneficial uses

Leaching potential may be evaluated using a) Best Professional Judgment, b) attenuation factor methods, c) leaching potential tests using de-ionized water or by d) vadose zone computer model simulations with site specific data to support contentions that water quality will not be affected by remaining contaminants. Consideration should be given to fractional characterization of the total petroleum hydrocarbon compounds to assist in fate and transport evaluation of petroleum hydrocarbons in soil. Fluctuating ground water tables that re-dissolve petroleum hydrocarbons into ground water must be considered. Higher concentrations of petroleum hydrocarbons may remain near the ground surface if sufficient attenuation capacity in the soil exists to protect ground water.

5. A 50/25 foot separation remains

Board staff's experience in the Lahontan region has found that sites with lighter fractions of petroleum hydrocarbons (C_1 - C_{15}) in dry climates must have at least a 50 foot separation from the highest historical ground water table. Sites with heavier fractions of petroleum hydrocarbons (heavier than C_{20}) must have at least a 25 foot separation from the highest historical ground water. Sites that meet this criteria are allowed to have higher soil concentrations remaining at closure.

6. There is no vapor migration potential

If soil BTEX[1] concentrations are less than the LUFT[2] Table 2-1 recommendations, vapor migration is expected to be minimal. If volatile constituent concentrations are higher, data from a soil gas survey must be done to demonstrate that there is no vapor migration potential.

[1] Benzene, Toluene, Ethylbenzene and Xylene
[2] SWRCB leaking underground fuel tank manual

7. Risk

A qualitative assessment must be performed for each site to evaluate threat to ground water, human health or other ecological risks. The results of a quantitative risk assessment may be used for contaminant fate and transport analysis and to demonstrate that the site does not pose an unacceptable human health risk.

8. Soil Remediation

Sites that do not meet the above criteria must take actions to meet the requirements of State Water Resources Control Board (SWRCB) Resolution 92-49, Section III.G. Such actions include, but are not limited to, active cleanup measures, source removal, and/or long term monitoring.

9. Documentation

A Case Closure summary table must be used to document site conditions remaining at closure. The Base Closure Summary table and instructions for completion (file USTclose.doc) may be downloaded from the Regional Board's homepage at the address below. If contaminants remain onsite, a narrative description must be included, clearly presenting the rationale for closure with respect to human health, ecological receptors, and water quality objectives listed in the Basin Plan. A case summary must be provided as well. For cases with petroleum hydrocarbons remaining in soil, that information must be sent to the SWRCB for entry into a database.

REFERENCES - The following reference documents should be consulted when evaluating an appropriate soil cleanup level for petroleum hydrocarbons.

1. Water Quality Control Plan for the Lahontan Region (Basin Plan), revised 1995
2. State Board Resolution 92-49 (Policies and Procedures for Investigation and Cleanup and Abatement under Water Code Section 13304)
3. California Underground Storage Tank Regulations, Title 23, Division 3, Chapter 16
4. California Waste Disposal to Land Regulations, Title 27, Division 2, Chapter 15
5. California Water Code Section 13000 et seq.
6. California Health and Safety Code , Chapter 6.7, Section 25280 et. seq.
7. Leaking Underground Fuel Tank Manual, California State Water Resources Control Board, 1988, revised 1989
8. The Designated Level Method for Waste Classification and Cleanup Level Determination, Central Valley Regional Water Quality Control Board, updated 1989
9. Interim Site Assessment and Cleanup Guidebook, May 1996, Los Angeles Regional Water Quality Control Board, 1996
10. Risk Based Corrective Action Applied at Petroleum Release Sites (E 1739-95), Associate For Testing and Materials, 1995
11. A Compilation of Water Quality Goals, Central Valley Regional Water Quality Control Board, updated 1995
12. Interim Risk Assessment Guidance for Superfund (vols. I-III), EPA\540\1-89\002
13. Lahontan Regional Board Staff Report, October 1997, Soil Petroleum Hydrocarbon Cleanup
14. Lahontan Regional Board, UST Closure Review Information, May 1997

Additional Information - Please contact staff of the California Regional Water Quality Control Board, Lahontan Region in South Lake Tahoe or Victorville.

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